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**NEW SPECIES AND NEW RECORDS OF RARE ANTARCTIC  
*PARALIPARIS* FISHES (SCORPAENIFORMES: LIPARIDIDAE)**

by

David L. Stein and Linda S. Tompkins

## ABSTRACT

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The liparidid fishes collected in the Southern Ocean by the U.S. Navy vessel "Eltanin" were reviewed in an unpublished M.Sc. thesis by the junior author (Tompkins, 1977). These collections include several hundred specimens, of which 134, representing at least 10 species of the genus *Paraliparis*, have been re-examined by the senior author and are the subject of the present paper.

Descriptions are given for five new species of Antarctic *Paraliparis*: *P. anarthractae*, *P. andriashevi*, *P. eltanini*, *P. incognita*, and *P. fuscolingua*. Four of the new species are illustrated; the fifth (*P. incognita*) was illustrated by Andriashev (1986: Fig. 59) as *P. terraenovae* Regan, 1916. *P. edentatus* Andriashev, 1986 is synonymized with *P. terraenovae*, and additional data on this species are presented. A probable new species of *Paraliparis* is diagnosed but not named due to the poor condition of the single specimen. New records of five other rare species (*P. antarcticus* Regan, *P. devriesi* Andriashev, *P. meganchus* Andriashev, *P. stehmanni* Andriashev, and *P. tetrapteryx* Andriashev) are discussed.



# NEW SPECIES AND NEW RECORDS OF RARE ANTARCTIC *PARALIPARIS* FISHES (SCORPAENIFORMES: LIPARIDIDAE)

by

David L. Stein<sup>1</sup> and Linda S. Tompkins<sup>2</sup>

## INTRODUCTION

Between 1963 and 1972, the U.S. Navy vessel "Eltanin", with National Science Foundation support, made many collections of Antarctic fishes with bottom and midwater trawls. These collections include several hundred specimens of liparidid fishes of which 134 represent at least 10 species of the genus *Paraliparis*. These specimens were the subject of an unpublished M.Sc. thesis (Tompkins, 1977) and have been re-examined by the senior author for this paper. Four of the species represented are new to science and are described herein. A new name is given for a previously unrecognized new species described as *P. terraenovae* by Andriashev, 1986. Range extensions and additional morphological data of the specimens of previously known species are also presented. We provide a diagnosis for, but do not name an apparently new taxon represented by a single specimen in relatively poor condition. To avoid potential confusion resulting from naming this species based upon a necessarily partial description, we believe it is wiser to await availability of better material.

## METHODS

Counts and measurements follow Stein (1978a). Pore nomenclature and terminology of pectoral fin and girdle morphology follow Andriashev (1986). Specimens listed herein are deposited at the Los Angeles County Museum of Natural History (LACM), Zoological Institute of Leningrad (ZIL), and the Institut Royal des Sciences Naturelles, Bruxelles (IRSNB). Fish were radiographed to provide vertebral counts, which do not include the hypural plate. Pectoral girdles were dissected from one specimen of each new species and from *P. stehmanni* and cleared and stained with alizarin red S and alcian blue by the method of Dingerkus and Uhler (1977). The cephalic lateralis system was demonstrated by compressed air introduced by hypodermic needle via the pores. Abbreviations used herein are: anus-A, distance from anus to anal-fin origin; mand-anus, distance from tip of lower jaw to center of anus; BD, maximum body depth; GO, gill-opening length; HL, head length; HW, head width; IO, interorbital width; LPL, lower pectoral-fin lobe length; preA, pre anal-fin length; preD, pre dorsal-fin length; SL, standard length; UPL, upper pectoral-fin lobe length; sn-anus, distance from snout to anus.

## *Paraliparis anarthractae* sp. n.

Figs. 1 & 2

HOLOTYPE: LACM 10727-5, female 57 mm SL, "Eltanin" Stn 964, 53° 28.5'S, 70° 46' W, 3-m IKMT, 7 February 1964, ca 55 m.

PARATYPES: LACM 10727-6, female 69 mm SL, female 54 mm, female 54 mm, male 50 mm, sex unknown 38 mm, female 38 mm, male 30 mm, male 26 mm, female 25 mm, captured with holotype. LACM 10726-1, female 53 mm, "Eltanin" Stn 962, 53° 55.5'S, 71° 13.5' W, 3-m Blake Trawl, 6 February 1964, 485 m. LACM 10728-3, female 50 mm, male 26 mm, "Eltanin" Stns 964/965, 53° 28.5'S, 70° 46' W, 3-m IKMT, 7 February 1964, 0-55 m. LACM 10450-2, female 65 mm, male 40 mm, "Eltanin" Stn 963, 53° 46.5'S, 70° 53' W, 3-m Blake Trawl, 6 February 1964, 485 m.

Cleared and stained: LACM 10727-2, females 62, 58 mm, captured with holotype.

OTHER MATERIAL: LACM 10727, 52 specimens 22 — 56+ mm, captured with holotype. LACM 10728-2, 31 specimens 25 — 54 mm, station data as for LACM 10728-3. LACM unaccessioned, 3 specimens 44 — 54+ mm, station data as for LACM 1045-2.

DIAGNOSIS: A *Paraliparis* with 38 — 41 dorsal and 37 — 39 anal fin rays unsegmented except for tips of posteriormost rays. Caudal rays segmented in larger individuals, pectoral rays segmented at all sizes examined. Pectoral rays 14 — 16, intermediate notch moderately deep. Principal caudal rays 8. Gill slit above pectoral fin and extending ventrally in front of 11 — 12 pectoral rays. Coronal pore present.

DESCRIPTION: D 38 — 41; A 37 — 39; P 14 — 16; C 8. Vertebrae 44 — 47 (7 — 9 + 37 — 38). Pyloric caeca 3. Cephalic pores 2-6-7-1 plus 1 coronal pore. Pectoral radials 3. HL 28.6 — 32.8, eye 4.0-5.7, BD 21.5 — 25.7, preD 32.0 — 37.7, preA 33.2 — 44.2, UPL 12.4 — 19.1, and sn-anus 18.1 — 24.4% SL; HW 42.0 — 58.5, eye 12.2 — 19.3, and GO 40.5 — 53.5% HL; sn-anus 78.6 — 137.2% anus-A.

Head small, evenly rounded in anterior profile. Eyes relatively large, prominent, well below dorsal profile of head. Eyes in individuals shorter than about 38 mm SL relatively smaller in relation to both SL and HL. Nostrils single, not tubular, immediately anterior to orbits on same horizontal plane as pupil of eye. Cephalic pores 2-6-7-1. Lower jaw pores much bigger than those elsewhere on head. Symphyseal pore pair widely spaced. Coronal pore difficult to demonstrate, on a line just anterior to orbits. Mouth horizontal; upper jaw extending well behind eye. Jaw teeth small, simple, sharp canines, some slightly recurved, sharper in smaller individuals. Premaxillary teeth forming a

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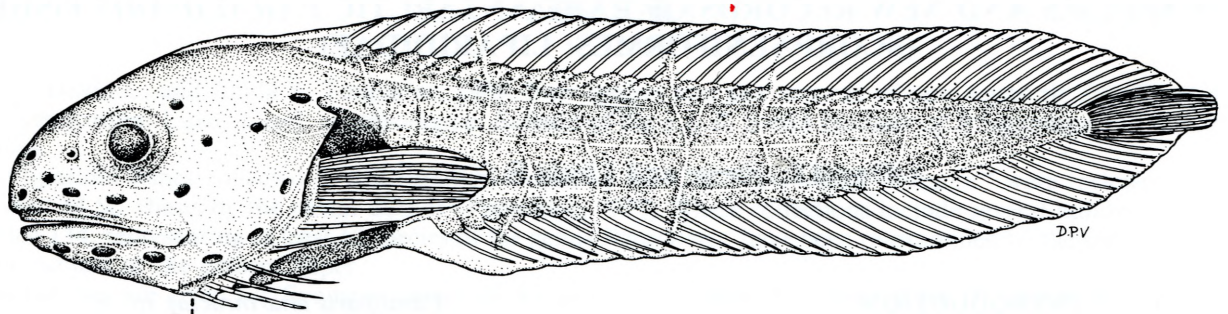


Figure 1. *Paraliparis anarthractae* new species. Holotype, LACM 10727-5, female 57 mm SL.

narrow band of about 35 oblique rows of up to seven teeth each. A wide gap in teeth at junction of premaxillae, forming a notch into which prominent lower jaw symphysis fits; gap very narrow or absent in lower jaw. Dentary teeth similar in character and arrangement.

Gill opening starting well above pectoral fin base, extending ventrally in front of 11 — 12 pectoral-fin rays, generally about 40 — 50% HL (individuals longer than about 55 mm SL have relatively longer gill openings). Branchiostegal rays clearly entering ventral margin of gill opening which is thus slightly emarginate. Anterior (ventral) end of slit slightly behind anus, far behind a vertical through rear of orbit.

Pectoral-fin upper ray about level with lower margin of orbit. Upper lobe of 8 — 10 rays, these gradually shortening and becoming much more widely spaced in notch, often difficult to distinguish from notch rays. Longest rays reaching well behind anal fin origin, as far as third or fourth anal ray. Fin notch moderately deep, no rays rudimentary. Individuals longer than about 5 cm have relatively longer upper lobes (about 15 — 20% vs 12 — 14% SL). Lower lobe rays 3, mostly free, elongate but shorter than upper lobe rays. All pectoral rays segmented. Cleithrum with 3 round radials (Fig. 2), two (small) dorsal radials widely separated from the ventral (largest) one. Scapula length about equal to width. Helve of coracoid very long, 175% its width or more.

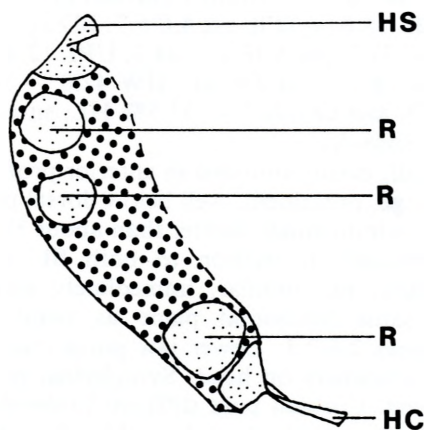


Figure 2. Right pectoral girdle, *Paraliparis anarthractae* new species. Paratype, LACM 10727-2, female 62 mm SL. HS—helve of scapula; R — radials; HC — helve of coracoid. Coarse stipple — cartilage; fine stipple — bone.

Body tapers rapidly posterior to head; dorsal fin origin about even with opercular flap. In specimens longer than about 5 cm SL, snout-anus distance less than anus-anal fin distance, anus below rear of orbit or slightly posterior to it. In smaller individuals, snout-anus distance greater than anus-anal fin distance, anus about midway between rear of orbit and opercular flap. Dorsal and anal-fin rays generally unsegmented, although clearly bilaterally divided. In largest specimens, posteriormost rays distally segmented. Caudal fin principal rays 4 + 4, often with either a dorsal or ventral procurrent ray, rarely with both. In specimens longer than about 3 cm SL, caudal rays distally segmented. Dorsal and anal fins completely overlapping caudal. Skin thin, fragile.

Stomach and pyloric caeca located left ventrally in body cavity. Pyloric caeca large, digitate, ventral to pylorus.

Colour in alcohol pale, skin transparent with scattered melanophores dorsally. Oral and branchial cavities pale. Peritoneum shows silver through body wall, internally black. A narrow midventral black line surrounding anus and extending posteriorly to completely divide peritoneum into two clamshell-like halves. Stomach and pyloric caeca black.

**ETYMOLOGY:** From the Greek “arthron”, jointed, and “aktis”, ray, with the prefix “an”, not, in the genitive case, indicating the general absence of articulations in the dorsal and anal-fin rays.

**RELATIONSHIPS:** *P. anarthractae* is very similar to both *P. australis* and *P. debueni*, but differs distinctly from both in the unsegmented vertical fin rays, reduced number of dorsal and anal fin rays, and presence of a coronal pore. It differs further from the latter in having a horizontal rather than an oblique mouth.

**REMARKS:** This is one of a putative species group being studied by the senior author, including *P. micrurus* (Barnard) (Stein 1978b). Members of this group have short bodies, round heads, and a coronal pore. Their actual relationships remain to be clarified, particularly because some have oblique mouths and some horizontal.

*P. anarthractae* appears to be unique among known liparids in the predominance of unsegmented dorsal and anal-fin rays, and in having about the same number of rays in each longitudinal fin. Able, Markle and Fahay (1984) suggested, based on the delayed development of “adult” characters associated with assumption



of a demersal habitat, that at least some liparidid genera and species arose by neoteny. The presence of unsegmented rays in *P. anarthractae* supports this view particularly strongly because the species is pelagic.

Females may reach a greater length than males (69 vs 57 mm SL); only a single male longer than 51 mm was collected. Females longer than cm SL had apparently ripe eggs up to 2.0 mm diameter; two had 59 and 67 eggs. Capture of such large numbers of individuals in apparently ripe condition suggests a possible spawning aggregation.

**DISTRIBUTION:** Known only from the Strait of Magellan and possibly well south of Cape Horn. Specimens were captured in two 3-m IKMT tows (20 and 55 m) and twice by 3-m Blake Trawl (256 — 320 m, 485 m). The species is probably pelagic; only six of the 100 individuals were collected by Blake Trawl. Collections from the IKMT's are combined, but both stations 964 and 965 were in the Strait of Magellan. Information about stations 962 and 963 is contradictory. "Eltanin" station data shows these to be in the Strait of Magellan, but a synoptic atlas of "Eltanin" stations (Savage and Geiger, 1965) shows them substantially farther south at about 60°S.

*Paraliparis eltanini* sp. n.

Figs. 3 & 4

**HOLOTYPE:** LACM 10450-3, female 84 mm SL, "Eltanin" Stn 963, 53° 46.5' S, 70° 53.0' W, 3-m Blake Trawl, 6 February 1964, 485 m.

**PARATYPES:** LACM 10450-4, female 88 mm, female 85+ mm, female 76 mm SL; captured with holotype.

**DIAGNOSIS:** Distinct from all other *Paraliparis* in having a coronal pore, 58 — 60 dorsal and 51 — 52 anal-fin rays, 18 — 21 pectoral-fin rays, pectoral-fin dorsal ray even with or below posterior corner of maxilla, and gill opening above pectoral fin and extending ventrally in front of about 5 rays.

**DESCRIPTION:** D 58 — 60; A 51 — 52; P 18 — 21; C 4. Vertebrae 63 — 64 (10 + 53 — 54). Pyloric caeca 6 — 10. Cephalic pores 2 — 6 — 7 — 1. Pectoral radials 4. BD 19.7 — 21.7, HL 19.3 — 21.8, preA 31.6 — 33.4, preD 21.3 — 25.8, sn-anus 14.5 — 15.7, UPL 19.2 — 22.5% SL; eye 22.9 — 32.3, HW 58.8 — 74.1% HL; sn-anus 60.4 — 78.9% anus-A.

Anterior profile of head evenly rounded, snout blunt, projecting slightly. Eyes prominent, less than 33% HL, the orbits not reaching dorsal profile of head. Nostrils single, not tubular, immediately anterior to orbit on same plane with pupil of eye. Mouth horizontal. Maxilla reaching to below posterior half of eye. Coronal pore small, easily overlooked; other cephalic pores prominent. Lower jaw pores much larger than those elsewhere on head. Symphyseal pore pair widely separated, distinctly smaller than other pores in series. Mouth terminal. Teeth tiny, simple, stout, slightly recurved canines forming narrow bands in both jaws. Posterior premaxillary teeth in oblique rows of up to 8 teeth each, but anteriorly arranged very irregularly. Wide gap in tooth band at juncture of premaxillae. Dentary teeth almost completely irregular with little or no gap at symphysis. Gill opening starting well above pectoral fin base, extending ventrally in front of 4 — 5 pectoral fin rays.

Pectoral-fin upper ray level with or below posterior end of maxilla. Longest rays of upper lobe reaching first or second anal-fin ray. Fin notch moderately deep. No rudimentary rays present. Upper lobe of 12 — 13 rays, notch rays 2 — 4, lower lobe rays 3 — 5; spacing in notch much wider than in lobes, but spacing not changing abruptly. Longest rays of upper and lower lobes about equal. Lower lobe rays very long, free almost to bases. Cleithrum with 4 very large, squared, closely set radials (Fig. 4). Helve of scapula about 50% its width. Helve of coracoid very short, about 33% its width.

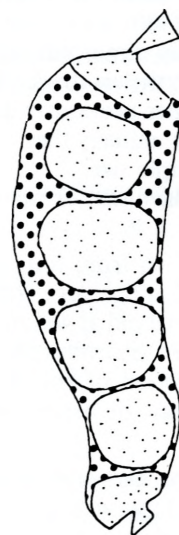


Figure 4. Right pectoral girdle, *Paraliparis eltanini* new species. Paratype, LACM 10450-4, female 84 mm SL.

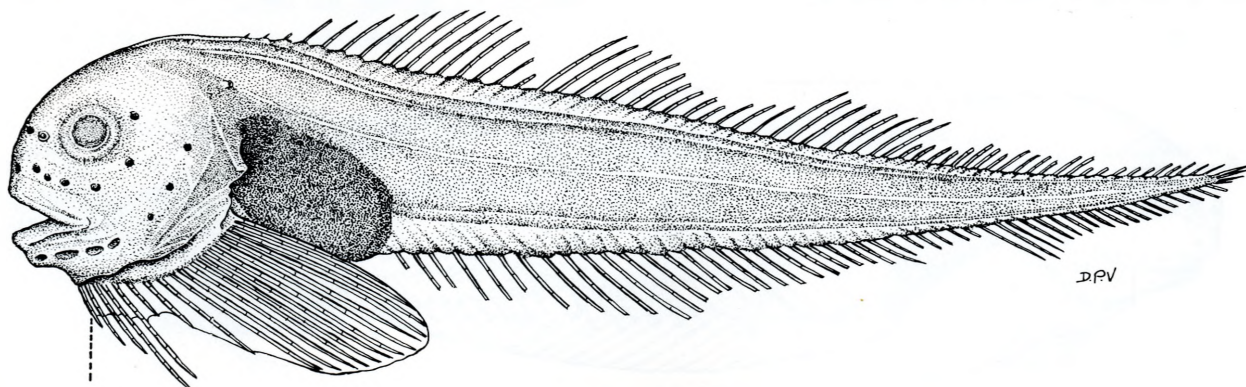


Figure 3. *Paraliparis eltanini* new species. Holotype, LACM 10450-3, female 84 mm SL.



Body tapers slowly posterior to head; dorsal fin origin behind opercular flap. Anus below rear of orbit or somewhat behind it, immediately behind cleithral symphysis, protruding. Caudal-fin rays 2+2, overlap unknown (damaged in all specimens). Skin thin, fragile.

Stomach and pyloric caeca located left ventrally. Pyloric caeca about 6 — 10, stout, stubby to moderately long.

Colour in alcohol pale, skin transparent with scattered melanophores dorsally. Oral and branchial cavities light brown or dusky. Peritoneum dark brown, visible through body wall. Stomach blackish, caeca pale.

**ETYMOLOGY:** This new species is named after the R/V "Eltanin", the ship which collected it and many other Antarctic fishes.

**RELATIONSHIPS:** This species may be part of the *P. micrurus* species group because of its coronal pore, but it lacks an oblique mouth and has much higher vertebral, dorsal, and anal fin counts, reduced caudal fin and more elongate body. These differences suggest that the coronal pore is a homoplasy of *P. eltanini* with the *P. micrurus* group. Only a thorough analysis will define the actual relationships of these species.

**REMARKS:** Although all the known specimens are females, we do not doubt this is a new species. The little sexual dimorphism that has been described in liparidids (Able and McAllister, 1980) primarily concerns *Liparis* and is mainly associated with tooth pattern and number, number of pectoral fin rays and pyloric caeca, and presence of prickles in males only. Although it is true, as Able and McAllister (1980) state, that much of the variation considered sexually dimorphic is probably related to small sample sizes, nevertheless the differences between the new species and any other previously described species are so great that it is highly unlikely they are the result of sexual dimorphism or sample size.

All four specimens have ripe or ripening eggs of 2.3 — 2.5 mm diameter.

**DISTRIBUTION:** Known from four specimens collected with a 3-m Blake Trawl at the same station in the Strait of Magellan near Dawson Island at 485 m (but see comments under distribution of *P. anarthractae*). Body shape, fin morphology, and reduction of the disk suggest that the species is probably pelagic or benthopelagic.

*Paraliparis andriashevi* sp. n.

Figs. 5 & 6

**HOLOTYPE:** LACM 11467-2, male 181 mm SL, "Eltanin" Stn. 2121, 72° 26.5' S, 177° 08.0' E, 3-m, Blake Trawl, 12 February 1968, 1883 — 1890 m.

**PARATYPE:** LACM 11401-1, male circa 144 mm SL, "Eltanin" Stn. 1929, 74° 38.5' S, 175° 27' W, 1.5-m Blake Trawl, 28 January 1967, 2212 — 2306 m.

**DIAGNOSIS:** Distinguished by the following combination of characters: 57 — 58 dorsal-fin rays, 52 anal-fin rays, 24 — 25 pectoral-fin rays, and 9 — 11 pyloric caeca. Mandibular pore pair closely set, stomach and body completely pale, pectoral fin notch shallow with greatly exerted lower lobe rays, and the level of the dorsal pectoral-fin ray above the posterior corner of the premaxilla.

**Comparative material:** *P. somovi*, ZIL 44101, paratype, female 161 mm SL, R/V "Prof. Mesyatsev" Trawl 21b, 61° 39' S, 55° 39' W, South Shetland Is., 4 February 1975, 850 — 750 m.

*P. valentinae*, ZIL 46834, paratype, female 207 mm SL, RV "Volny Veter", Trawl 145, 68° 02' S, 34° 33' E, 23 February 1983, 950 — 1100 m.

**DESCRIPTION** (Data for paratype in parentheses): D 58 (57); A 52 (52); P 24 (24); C 4 + 5 + 1. Vertebrae 63 (60), 9 — 10 + 51 — 53. Pyloric caeca (ca 9) 11. Cephalic pores 2 — 6 — 7 — 1. Pectoral radials 4. HL 21.4 (20.1), HW 14.9 (14.9), BD 19.0, preD 23.6, preA 35.9, sn-anus 17.3 (18.9), anus-A 17.3, UPL 16.2 (15.5), LPL 12.2 (11.2), eye 5.5 (5.3), snout 4.6, IO 6.2, and GO 8.3% SL; eye 25.6 (26.2), IO 29.2 (35.9), GO 38.8 (36.6), UPL 75.7 (76.9), LPL 56.9 (55.9), longest pyloric caecum 23.3 (36.2) and mandibular pore pair interspace 3.9 (2.5) % HL.

Snout short, blunt, high, protruding. Dorsal profile of head sloping flatly forward to the almost vertical snout. Eyes large, not entering dorsal profile of head. Nostrils single, distinctly tubular, short; on horizontal with centre of pupil. Symphyseal mandibular pore pair closely set, much smaller than other pores in the same series. Mouth inferior, relatively large, horizontal. Upper jaw distinctly including lower. Maxilla reaching below posterior edge of pupil, oral cleft reaching below mid-pupil. Teeth short, stout, blunt, arranged in about 6 — 8 long oblique rows of up to 11 teeth each. Larger specimen (holotype) with outer teeth simple stumps, a few of inner teeth with small shoulders. In smaller specimen, many more teeth with shoulders, much more obvious. Virtually no gap in tooth rows at symphyses of upper or lower jaws.

Gill opening starts dorsally at about level of upper margin of pupil and extends ventrally in front of about 6 pectoral-fin rays. Opercular flap about midway in gill opening, clearly triangular. Opercle curved, distal portion approaching horizontal, tip extending posteriorly just past bases of dorsalmost pectoral-fin rays. Anus about midway between gill opening and orbit.

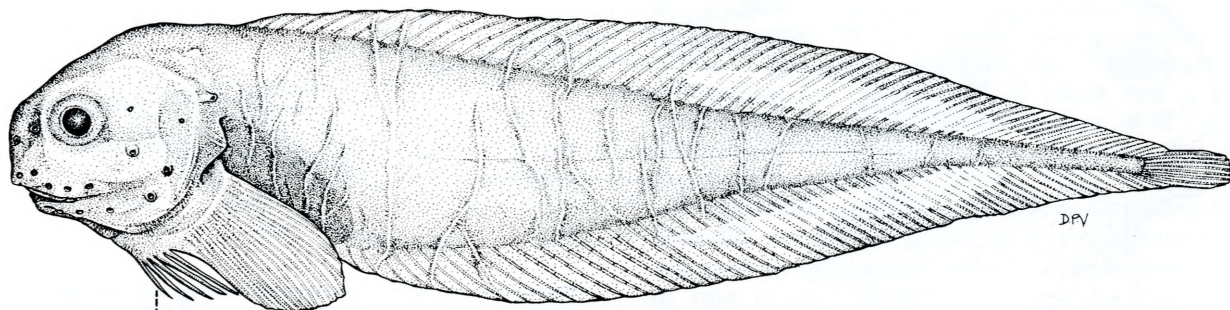


Figure 5. *Paraliparis andriashevi* new species. Holotype, LACM 11467-2, male 181 mm SL.



Level of pectoral-fin upper ray between lower margin of orbit and posterior corner of mouth. Upper lobe of pectoral fin reaching to second or third anal-fin ray. Fin notch shallow or absent, rudimentary rays absent. Upper lobe of 17 — 18 rays, edge emarginate but profile formed by ray tips evenly rounded, spatulate. Spacing between rays abruptly wider in notch. Anteriormost ray below posterior margin of orbit. Lower lobe rays 4 — 5. Rays ventral to upper lobe increasingly deeply exerted, almost completely free. Cleithrum with 4 more or less round evenly-spaced radials (Fig. 6). Scapula with dorsal helve much reduced or absent. Clavicle with relatively large anterodorsal foramen, helve reduced or absent.

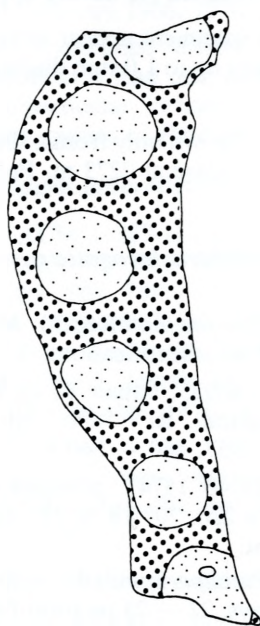


Figure 6. Right pectoral girdle, *Paraliparis andriashevi* new species. Paratype, LACM 11401-1, male ca. 144 mm SL.

Body tapering slowly, tail elongate. Dorsal fin origin about over gill opening. Dorsal fin of holotype with a rudimentary final caudal element visible on radiograph, not counted. Male with a short, stout genital papilla. Caudal fin of 4 + 5 primary rays; holotype has a single auxiliary ray ventrally. Dorsal and anal fins overlap caudal about 25%. Skin thin, fragile.

Stomach and pyloric caeca midventral in body cavity. Pyloric caeca 9 — 11, digitate, slender. In holotype, longest caecum relatively much shorter than in paratype.

Colour in alcohol pale, skin posterior to head on abdominal region slightly rosy. Oral cavity pale anteriorly but dusky posteriorly as it merges with the dark branchial cavity. Peritoneum dark brown, clearly visible through body wall. Stomach and pyloric caeca pale.

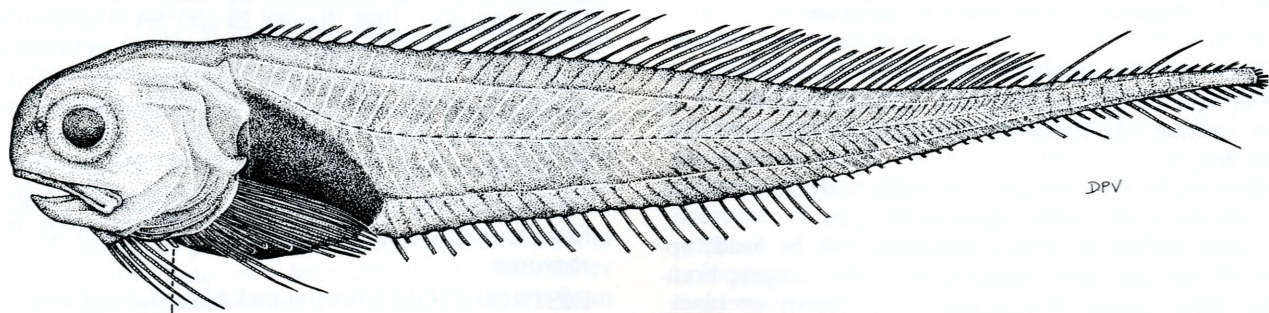


Figure 7. *Paraliparis fuscilingua* new species. Holotype, LACM 11351-4, female 115 mm SL.

**ETYMOLOGY:** This species is named after Dr. A.P. Andriashev in honour of, and in respect for, his great contributions to polar ichthyology and our knowledge of liparidids.

**RELATIONSHIPS:** *P. andriashevi* is very similar to *P. somovi* Andriashev and Neelov, 1979. Although there are many differences, *P. andriashevi* can be distinguished most easily by the difference in mandibular pore pair size from remainder of the series (distinctly smaller vs only slightly smaller or same size in *P. somovi*) and spacing (3.9 vs 6.2% HL), relatively more posterior anus (preanus length more than 17.3 vs less than 16.8% SL), longer gill opening (more than 36.6 vs less than 33.3% HL), smaller eye (less than 26.2 vs more than 30% HL), much smaller pyloric caeca in larger individuals (23.3 vs 38.3% HL), and the overlap of the opercular spine with the pectoral-fin base (barely overlapping vs. extending well behind).

The counts and proportions of *P. andriashevi* are also very similar to those of *P. valentinae* Andriashev and Neelov, 1984. However, the new species is distinguished by its completely pale body and fin rays (vs. dusky overall with black fin rays), longer gill opening (36.6 — 38.8 vs 27.0 — 29.5% HL), larger eye (25.6 — 26.2 vs 20 — 23% HL), more posterior anus (17.3 vs 11.7 — 13.8% SL), dorsal pectoral-fin ray above posterior corner of mouth (vs even with or below it), completely pale stomach and blood vessels (vs pale with black blood vessels), and pale mouth (vs blackish grey).

**REMARKS:** The change in tooth characteristics appears to be size related.

**DISTRIBUTION:** Known only from two specimens collected in the Ross Sea between 1883 — 2306 m. Probably benthic.

#### *Paraliparis fuscilingua* new species

Figs. 7 & 8

**HOLOTYPE:** LACM 11351-4, female 115 mm SL, "Eltanin" Stn 1867, 70° 55' S, 172° 59.5' E, 3-m Blake Trawl, 13 January 1967, 2273 m.

**PARATYPE:** LACM 11351-7, female 84 mm SL, captured with holotype.

**DIAGNOSIS:** Distinguished by 61 — 63 dorsal-fin rays, 54 — 57 anal-fin rays, 24 — 25 pectoral-fin rays, and 8 caudal-fin rays; tongue and mouth both dusky; anus much closer to tip of mandible than to anal fin origin; scapula and dorsalmost pectoral radial unnotched.

**DESCRIPTION:** (Data for paratype in parentheses) D 63 (61); A 54 (57); P 25 (24); C 4 + 4; Vertebrae 67 (68), 9 + 58 — 59. Pyloric caeca 9 (8). Cephalic pores unknown.



Pectoral radials 4. HL 19.4 (19.6), HW 59.6, BD 16.5 (7.3), preD 20.5 (21.3), preA 30.6 (27.6), sn-anus 15.9 (15.8), mand-anus 13.0 (12.7) anus-A 15.8 (14.5), UPL 13.4, LPL 12.1, and eye 5.6 (4.3) % SL. Eye 29.2 (21.8) % HL; mand-anus 81.9 (64.8) % anus-A.

Head relatively small, the dorsal profile gradually sloping to short, blunt, rounded snout. Eyes large, not quite entering profile of head. Nostrils single. Cephalic pores unknown due to damage in both specimens; symphyseal pore pair apparently well-spaced. Mouth horizontal, moderately large; maxilla extends to below rear of eye. Lower jaw slightly included. Jaw teeth sharp, recurved canines, forming a narrow band of irregular rows of up to 4 teeth. A wide gap at symphysis of upper jaw, distinct notch present between jaw halves. Dentary teeth similar to those of upper jaw, but symphyseal gap not noticeable. Gill opening damaged in both specimens, but apparently completely above pectoral-fin or extending ventrally in front of only 1 or 2 rays. Anus below interopercle, anterior to opercular flap; distinctly nearer mandibular symphysis than to anal fin origin.

Pectoral-fin upper ray level about even with lower margin of orbit. Upper pectoral-fin lobe of 14 — 16 rays, reaching to or slightly behind anal-fin origin. Fin notch moderately deep, rays more widely spaced, rudimentary rays absent. Lower lobe of about 5 rays. Cleithrum with 4 irregularly round unnotched radials, a wide space present between third and fourth; scapula helve less than 50% width, without notch (Fig. 8). Coracoid ventrally notched, without helve.

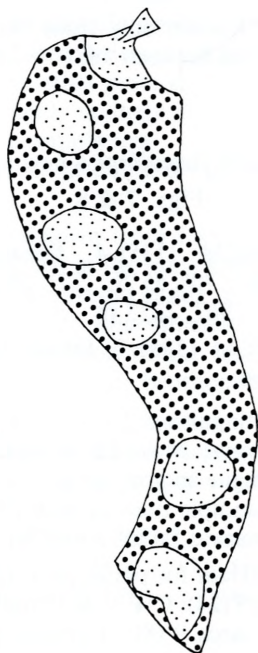


Figure 8. Right pectoral girdle, *Paraliparis fuscolingua* new species. Paratype, LACM 11351-7, female 84 mm SL.

Body tapering gradually to caudal. Dorsal-fin origin about over tip of opercular flap. Caudal fin of 8 (4 + 4) rays, overlap with dorsal and anal-fin rays unknown. Skin thin, fragile.

Stomach and pyloric caeca ventral in body cavity. Caeca 8 — 9, short, fat, semi-triangular or blunt.

Colour unknown. From remaining skin on head, apparently at least head dusky. Oral cavity, tongue, branchial cavity dusky. Peritoneum dark brown or black. Stomach and caeca pale.

ETYMOLOGY: From the latin “fuscus”, dark, and “lingua”, tongue, in recognition of the dusky tongue of this species, a noticeable difference from *P. leucoglossus* Andriashev, 1986 to which the new species is most similar.

RELATIONSHIPS: *P. fuscolingua* is most similar to *P. leucoglossus* but differs distinctly in many characters. In the former, tongue and mouth are both dusky (vs pale and dusky respectively in the latter), the anus is much farther anterior (below preopercle vs below posterior of gill flap; distance from mandible-anus 81.9 — 87.7 vs >100% anus-A distance); gill slit apparently above pectoral (vs in front of 5 — 6 pectoral rays); and scapula and uppermost pectoral radial un-notched (vs having opposing notches).

REMARKS: Both specimens appear to be unripe females; the holotype has eggs up to 1.0 mm diameter, the paratype to 0.5 mm.

DISTRIBUTION: Known only from a single station in the Ross Sea off Cape Adare at 2273 m. Probably benthic.

### *Paraliparis incognita* n.sp.

*Paraliparis terraenovae* (non Regan): Andriashev, 1986: 135, Figs. 59 & 60 (misidentification).

HOLOTYPE: ZIL 45935, female 80 or 90 mm SL (data confused in description), R/V “Ob” Stn 282, 64° 06’ S, 98° 27’ E, 9 April 1957, 460 — 560 m.

PARATYPES: IRSNB 15747, juveniles 46 and 57 mm SL, R/V “Iris” Stn 220, 70° 18’ S, 23° 58’ E, 1 February 1965, 420 — 450 m.

DIAGNOSIS: A *Paraliparis* with 48 — 50 dorsal-fin rays, 43 — 45 anal-fin rays, 22 — 23 pectoral-fin rays and 53 — 57 vertebrae. Jaw and pharyngeal teeth present. Upper pectoral-fin lobe of 15 — 16 rays.

REMARKS: These specimens were used as the basis for a redescription of *P. terraenovae* Regan, 1916 by Andriashev (1986). However, our examination of the holotype of *P. terraenovae* shows that Andriashev’s specimens represent a previously undescribed species (see *P. terraenovae*, below). Andriashev’s (1986) description of them (as *P. terraenovae*) is very good. Although we were unable to examine any of the above specimens, the following characters clearly justify our conclusions.

*P. terraenovae* has no jaw or pharyngeal teeth, whereas *P. incognita* has both. *P. terraenovae* has 8 rays in the upper pectoral fin lobe, and *P. incognita* has 15 — 16. In the former the short (20 — 25% HL) gill opening extends ventrally in front of 2 — 4 pectoral-fin rays, whereas in the latter it is much longer (> 33% HL) and extends in front of 6 — 7 rays. The locations of the pores of the cephalic lateralis system are different, especially behind the orbit (see Andriashev, 1986, figures 29 and 59). The nostrils of *P. terraenovae* have raised rims; those of *P. incognita* have short tubes. Other differences also exist, but will not be repeated here because they are less distinctive and are in Andriashev’s (1986) descriptions of *P. terraenovae* (as *P. edentatus*) and of this species (as *P. terraenovae*).

ETYMOLOGY: From the latin “incognitus”, unidentified, because the species was initially mistaken for *P. terraenovae*.

DISTRIBUTION: Mawson and Riiser-Larson seas at 420 — 560 m. Probably pelagic.



*Paraliparis* sp.

DIAGNOSIS: A *Paraliparis* with 59 dorsal-fin rays, about 46 anal-fin rays, 63 vertebrae, 25 — 27 pectoral-fin rays, 8? caudal-fin rays, and more than 12 pyloric caeca. Mouth horizontal, teeth trilobed forming bands, mandibular symphyseal pores widely separated, moderately large. Gill opening above and in front of 4 — 5 pectoral-fin rays, branchial cavity dark brown. Rudimentary pectoral-fin rays absent, notch moderately deep. Anus anterior to gill opening, peritoneum black, stomach completely pale.

MATERIAL: LACM 11043-1, male 53 mm SL, "Eltanin" Stn. 1555, 60° 06'S, 36° 01.5'W, 3-m Blake Trawl, 15 — 16 February 1966, 1976 — 2068 m.

REMARKS: This specimen differs significantly from every known species in at least one, and usually more than one character. In particular, its trilobed teeth distinguish it from most known species of *Paraliparis*.

*Paraliparis antarcticus* Regan, 1914

MATERIAL: LACM 11383-1, males 87 and 97 mm SL, "Eltanin" Stn 1905, 76° 28.5'S, 167° 56'E, 3-m Blake Trawl, 21 January 1967, 741 — 747 m. LACM 11454-1, male 97 mm SL, "Eltanin" Stn 2063, 78° 17'S, 177° 56.5'W, 3-m Blake Trawl, 26 January 1968, 636 — 637 m. LACM 11385-1, female 152 mm SL, "Eltanin" Stn 1907, 77° 03.5'S, 166° 14'E, 3-m Blake Trawl, 22 January 1967, 891 m.

REMARKS: These specimens were collected off McMurdo Station in the Ross Sea, the area where previous captures have been made.

*Paraliparis devriesi* Andriashev, 1980

MATERIAL: LACM 32735-1, male 140 mm SL, McMurdo Stn 64K, 7/8 distance from McMurdo Station to Williams Field, 46 m off the Ross Ice Shelf, fish trap, 28 July 1964, 500 m.

REMARKS: Collected from the same area as other known individuals. This capture, the shallowest recorded, decreases the known minimum depth of occurrence to 500 m.

*Paraliparis meganchus* Andriashev, 1982

MATERIAL: LACM 10532-2, males 114 and 131 mm SL, "Eltanin" Stn 538, 60°29.5'S, 47° 31.5'W, 1.5-m Blake Trawl, 6 March 1963, 616 — 662 m. LACM 10434-3, males 130 and 140 mm SL, "Eltanin" Stn 428, 62° 40'S, 57° 48.5'W, 1.5-m Blake Trawl, 5 January 1963, 662 — 1120 m.

REMARKS: These specimens were collected from near the South Shetland Islands, as was the type series. Although the meristic characters of the "Eltanin" specimens match Andriashev's (1986) description well (the only difference is that the largest specimen has 18 P rays on one fin), the morphometric characters and colour of the peritoneum and stomach do not agree as well. In particular, our specimens have slightly shorter heads (21.8 — 22.8 vs 23.2 — 26.8% SL), anus closer to A origin (20.4 — 22.2 vs 23.2 — 28.2% SL), slightly smaller eyes (17.6 — 24.3 vs 25 — 29% SL) and paler peritoneum and stomach. However, in the comparative notes of a later description, Andriashev (1986 : 106) partially describes "15 related specimens from the South Orkney islands" which are similar to our

specimens.\* Comparison of our specimens to a paratype (ZIL 45708) leads us to conclude that the differences discussed by Andriashev (1986) are insignificant and that all the specimens may be referred to *P. meganchus*. The amended ratios are: HL 21.8 — 26.8, HW 13.4 — 16.3, preA length 33.2 — 41.4, preanus length 14.0 — 18.4, anus-A 20.4 — 28.2, UPL 13.3 — 17.9, LPL 13.4 — 17.5, eye 4.0 — 7.4, GO 12.2 — 15.3% SL. Eye 17.6 — 29% HL.

*Paraliparis stehmanni* Andriashev, 1986

MATERIAL: LACM 10784-1, male 98 mm SL, "Eltanin" Stn 995, 61° 55'S, 55°50'W, 3-m Blake Trawl, 14 March 1964, 2119 — 2562 m.

REMARKS: This specimen is damaged and very fragile, so some characters (D, A, C rays, preD, preA, anus-A, LPL lengths) could not be determined precisely. It is also about 10 cm shorter than the two known individuals. Nevertheless, we feel confident that it is *P. stehmanni*, especially because a cleared and stained pectoral fin and base demonstrate the essential elements described by Andriashev (1986): 4 radials, the upper 3 notched. Its morphometric ratios (all within about 1% of those of the types except for BD) are: HL 17.8, HW 13.1, BD 14.2, preanus length 17.6, UPL 12.6, eye 3.4, GO 2.6% SL. Eye 19.0, GO 14.9% HL.

*Paraliparis terraenovae* Regan, 1916

HOLOTYPE: BMNH 1916.3.20 : 29, juvenile 29 mm SL, McMurdo Sound, "Terra Nova" Stn 332, 77° 15'S, 166°E, 16 January 1912, 0 — 550 m.

Other material: LACM 11386-1, females 47 and 64 mm SL, "Eltanin" Stn 1908, 77° 04'S, 166°E, 3-m IKMT, 22 January 1967, 148 — 197 m. LACM 11382-1, females 48 and 55 mm SL, "Eltanin" Stn 1904, 76° 30'S, 171° 05.5'E, 3-m IKMT, 21 January 1967, 326-395 m. LACM 11392-1, juveniles 17, 23 mm SL and female 43 mm SL, "Eltanin" Stn 1917, 77° 35'S, 175° 04'E, 3-m IKMT, 25 January 1967, 340 — 368 m.

REMARKS: In 1986, Andriashev redescribed *P. terraenovae* from three specimens collected in 1957 and 1965. He did not examine the holotype, but relied on data from an examination by someone else. In the same publication, Andriashev described *P. edentatus* from two specimens collected together at 77° 23.8'S, 42° 32.2'W. Counts and proportions of the two species are similar in many ways, although they can be clearly distinguished by presence of jaw and pharyngeal teeth in "*P. terraenovae*" and their absence in *P. edentatus*. Andriashev's (1986) account of the holotype of *P. terraenovae* does not mention teeth, but it seems clear that he assumed they were present. We were unable to examine Andriashev's specimens of either species, but examination of the holotype of *P. terraenovae* (by D.S.) shows that it has no teeth whatsoever.

Furthermore, the "Eltanin" collections include specimens which were identified (Tompkins, 1977) as *P. terraenovae* which fit the description of *P. edentatus* almost perfectly and also seem to be conspecific with the holotype of *P. terraenovae*. Ontogenetic changes in presence of jaw teeth are unknown in liparidids. The holotype of *P. terraenovae* is in remarkably good condition considering its age and size, although the lower lobes of both pectoral fins are damaged. Andriashev's "*P. ter-*



*raenovae*” has upper pectoral-fin lobes of 14 — 15 rays; the holotype has upper lobes of 8 rays only, matching *P. edentatus*. Finally, the description of *P. edentatus* fits the holotype in all other respects that can be checked. Therefore, we conclude that *P. terraenovae* of Andriashev (1986) is a previously undescribed species, and that *P. edentatus* Andriashev, 1986 is a junior subjective synonym of *P. terraenovae* Regan, 1916.

The description of *P. terraenovae* by Andriashev (1986, as *P. edentatus*) is generally quite accurate; our specimens provide additional data requiring that it be amended as follows:

D 46 — 51; A 42 — 46; P 13 — 16; vertebrae 53 — 55. Pectoral-fin lower lobe of 2 — 4 rays. HL 20.9 — 27.0% SL, BD 18.4 — 22.1, preA 33.0 — 39.8, preanus length 16.9 — 29.9, UPL 8.6 — 18.4, LPL 5.4 — 14.5, eye 3.4 — 7.8% SL; eye 12.8 — 31% HL.

Several features of allometric growth are evident. Usually, relative eye diameter gradually increases with fish length. The anus in the smallest individual is posterior, almost at the end of the body cavity; it gradually assumes a more anterior position with increasing fish length. Upper and lower pectoral-fin lobe lengths become relatively longer with increasing fish length.

**DISTRIBUTION:** *P. terraenovae* has been reported from two widely separated areas (Ross and Weddell seas), suggesting that it has a circum-antarctic distribution. It is pelagic between 148 and 550 m.

#### *Paraliparis tetrapteryx* Andriashev & Neelov, 1979

**MATERIAL:** LACM 10582-1, female 145 mm SL, “Eltanin” Stn 678, 54° 48.5'S, 37° 57'W, 1.5-m Blake Trawl, 24 August 1963, 732 — 814 m.

**REMARKS:** This damaged specimen, from near South Georgia, the same area as the types, is the largest known of this species; Andriashev's (1986) largest specimen was 142 mm SL. The LACM specimen differs little from the original description based on five smaller specimens 108 — 116 mm SL. The most significant differences are a relatively smaller eye diameter (3.9 vs 5.5 — 6.5% SL, 21.7 vs 29 — 33% HL) and tooth shape. The original description describes the teeth as “small, simple, bluntly pointed”. In the new specimen, the dentary teeth, especially the posterior inner ones, have weakly developed shoulders. The teeth of a 108 mm SL paratype (ZIL 44097) are consistent with this change, having parallel-sides and relatively square tips.

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